

Listing of Claims:

This listing of claims reflects all claim amendments and replaces all prior versions, and listings, of claims in the application. Amendments are shown relative to the claims as presented in PCT patent application Serial No. PCT/US2004/042474, filed December 15, 2004. Material to be inserted is in **bold and underline**, and material to be deleted is in ~~strikeout~~ or (if the deletion is of five or fewer consecutive characters or would be difficult to see) in double brackets [[]].

1. (Currently amended) A coated stent [[[10]]], comprising:
a stent latticework [[[20]]]; and
an alginate coating [[[30]]] disposed on the stent latticework.
- 2-6. (Canceled)
7. (Currently amended) The coated stent of claim 1 further comprising:
a therapeutic component [[[34]]] dispersed within the alginate coating, wherein the therapeutic component acts as source of a therapeutic agent [[[40]]], and wherein the alginate coating controls elution of the therapeutic agent from the alginate coating.
8. (Original) The coated stent of claim 7, wherein the therapeutic component is selected from the group consisting of an anti-coagulant, an anti-platelet drug, an anti-thrombotic drug, an anti-proliferant, an inhibitory agent, an anti-stenotic substance, heparin, a heparin peptide, an anti-cancer drug, an anti-inflammatant, nitroglycerin, L-arginine, an amino acid, a nutraceutical, an enzyme, a nitric oxide synthase, a diazeniumdiolate, matrix metalloproteinase, a nitric oxide donor, rapamycin, a

rapamycin analog, paclitaxel, a paclitaxel analog, a coumadin therapy, a lipase, and a combination thereof.

9. (Currently amended) The coated stent of claim 1 further comprising:

a cellular component [(36)] dispersed within the alginate coating, wherein the cellular component controllably releases a therapeutic agent [(40)] when the coated stent is deployed within a vessel [(50)] of a mammalian body [(52)].

10. (Canceled)

11. (Original) The coated stent of claim 9, wherein the released therapeutic agent includes nitric oxide.

12. (Canceled)

13. (Currently amended) A method of treating a vessel [(50)] in a mammalian body [(52)], the method comprising:

providing a stent latticework [(20)];

coating the stent latticework with an alginate solution [(60)] to form a coated stent [(10)] having an alginate coating [(30)] disposed on the stent latticework;

positioning the coated stent within the vessel;

deploying the coated stent; and

eluting a therapeutic agent [(40)] from the alginate coating.

14-16. (Canceled)

17. (Currently amended) The method of claim 13, wherein the alginate coating includes one of a therapeutic component [(34)] or a cellular component [(36)].

18-19. (Canceled)

20. (Currently amended) The method of claim 13 further comprising:

determining a ratio of mannuronate alginate subunits [(62)] and guluronate alginate subunits [(64)] to provide a predetermined elution characteristic of the alginate coating;

mixing mannuronate alginate subunits, guluronate alginate subunits, an alginate solvent [(66)], and one of a therapeutic component [(34)] or a cellular component [(36)] to form an alginate solution [(60)] with the determined ratio of mannuronate alginate subunits and guluronate alginate subunits;

adding an alginate linking agent [(68)] to the alginate solution; and

coating the stent latticework with the alginate solution.

21. (Canceled)

22. (Currently amended) The method of claim 13 further comprising:

selecting at least one of a therapeutic component [(34)] and a cellular component [(36)]; and

mixing the selected at least one component into the alginate solution prior to coating the stent latticework.

23. (Currently amended) The method of claim 13 further comprising:

harvesting a viable cellular component [(36)] from the mammalian body; and

mixing the harvested viable cellular component into the alginate solution prior to coating the stent latticework.

24-25. (Canceled)

26. (Currently amended) An alginate coating [(30)] for an implantable medical device [(12)], the alginate coating comprising:

an alginate matrix [(32)]; and
at least one of a therapeutic component [(34)] and a cellular component [(36)]
dispersed within the alginate matrix.

27. (Canceled)

28. (Currently amended) An alginate implant [(130)] for treating a vessel
[(150)] in a mammalian body [(152)], the alginate implant comprising:

an alginate matrix [(132)] in contact with an endoluminal wall [(154)] of the
vessel; and

a central lumen [(142)] axially extending through the alginate matrix.

29-38. (Canceled)

39. (Original) The alginate implant of claim 28, wherein the implant is
configured as at least one of a stent and a cap for vulnerable plaque.

40. (Currently amended) A method of treating a vessel [(150)] in a
mammalian body [(152)], the method comprising:

forming an alginate implant [(130)] within the vessel, the alginate implant in
contact with an endoluminal wall [(154)] of the vessel and having a central lumen
[(142)] axially extending through the alginate implant; and

eluting a therapeutic agent [(140)] from one of a therapeutic component [(134)]
or a cellular component [(136)] dispersed within the alginate implant.

41-48. (Canceled)

49. (Currently amended) The method of claim **40** [[44]] further comprising:
determining a ratio of mannuronate alginate subunits [[[162)]] and guluronate alginate subunits [[[164)]] to provide a predetermined elution characteristic of the alginate implant; [[and]]

combining mannuronate alginate subunits, guluronate alginate subunits, the alginate solvent, and the therapeutic component or the cellular component to form the alginate solution with the determined ratio of mannuronate alginate subunits and guluronate alginate subunits;

adding an alginate linking agent into the alginate solution; and
injecting the alginate solution into a portion of the vessel with an implant formation catheter.

50-52. (Canceled)

53. (Currently amended) A system for forming an alginate implant [[[130)]] in a mammalian body [[[152)]], the system comprising:

an implant formation catheter [[[110)]] having a catheter body [[[112)]];

a formation balloon [[[120)]] attached to the catheter body near a distal end [[[114)]] of the catheter body; and

an alginate-delivery lumen [[[118)]] within the catheter body, wherein an alginate implant [[[130)]] is formed from an alginate solution [[[160)]] injected through the alginate-delivery lumen into a cavity [[[122)]] between the formation balloon and an endoluminal wall [[[154)]] of the vessel when the formation balloon is inflated.

54-58. (Canceled)

59. (Currently amended) A method of forming an alginate implant [(130)] in a vessel [(150)] of a mammalian body [(152)], the method comprising:

positioning an implant formation catheter [(110)] in the vessel, the implant formation catheter having a catheter body [(112)];

inflating a distal occlusion balloon [(124)] attached to the catheter body near a distal end [(114)] of the catheter body;

inflating a proximal occlusion balloon [(126)] attached to the catheter body proximal to the distal balloon;

inflating a medial formation balloon [(128)] attached to the catheter body between the distal occlusion balloon and the proximal occlusion balloon;

injecting an alginate solution [(160)] through an alginate-delivery lumen [(118)] into a cavity [(122)] formed between the inflated distal occlusion balloon, the inflated proximal occlusion balloon, the inflated medial formation balloon, and an endoluminal wall [(154)] of the vessel; and

hardening the alginate solution to form the alginate implant.

60-62. (Canceled)

63. (Currently amended) A method of forming an alginate implant [(130)] in a vessel [(150)] of a mammalian body [(152)], the method comprising:

positioning an implant formation catheter [(110)] at a first location [(174)] in the vessel, the implant formation catheter having a catheter body [(112)];

inflating an angioplasty balloon [(170)] attached to the catheter body near a distal end [(114)] of the catheter body, the angioplasty balloon having an alginate linking agent [(168)] disposed on a surface [(178)] of the angioplasty balloon;

depositing the alginate linking agent on an endoluminal wall [(154)] of the vessel;

deflating the angioplasty balloon;

repositioning the implant formation catheter at a second location [(176)] in the vessel, the second location in the vessel distal to the first location in the vessel;

re-inflating the angioplasty balloon;

inflating a formation balloon [(120)] attached to the catheter body proximal to the angioplasty balloon;

injecting an alginate solution [(160)] through an alginate-delivery lumen [(118)] into a cavity [(122)] formed between the formation balloon and an endoluminal wall [(154)] of the vessel; and

hardening the alginate solution to form the alginate implant, wherein the alginate solution is hardened by the alginate linking agent deposited on the endoluminal wall of the vessel.

64-67. (Canceled)

68. (Currently amended) A method of forming an alginate implant [(130)] in a vessel [(150)] of a mammalian body [(152)], the method comprising:

inserting an implant formation catheter [(110)] into the vessel, the implant formation catheter having at least one formation balloon [(120)];

injecting an alginate solution [(160)] into a cavity [(122)] formed between the formation balloon and an endoluminal wall [(154)] of the vessel when the formation balloon is inflated;

hardening the alginate solution to form the alginate implant; and

withdrawing the implant formation catheter from the vessel, wherein the formed alginate implant is in contact with the endoluminal wall of the vessel and includes a central lumen [142] axially extending through the alginate implant.

69. (Currently amended) An alginate bioreactor [310] for treating a mammalian body [350], the alginate bioreactor comprising:

an alginate matrix [320]; and

one of a therapeutic component [330] or a cellular component [332] dispersed within the alginate matrix, wherein a therapeutic agent [340] is eluted from the alginate matrix after the alginate bioreactor is formed within the body.

70. (Canceled)

71. (Currently amended) The alginate bioreactor of claim 69, wherein the alginate bioreactor is formed in a portion of the mammalian body, the portion of the mammalian body selected from the group consisting of a heart, a liver, a pancreas, a kidney, an eyeball, a pericardial space, a cerebral spinal space, a periorganic space, an organ, a vessel, and a tissue.

72-76. (Canceled)

77. (Original) The alginate bioreactor of claim 69, wherein the eluted therapeutic agent is selected from the group consisting of vascular endothelial growth factor, a biological anti-inflammatory agent, vitamin C, acetylsalicylic acid, a lipid lowering compound, a high-density lipoprotein cholesterol, a streptokinase, a kinase, a thrombolytic agent, an anti-thrombotic agent, a blood-thinning agent, a coumadin material, an anti-cancer agent, an angiogenic agent, an anti-angiogenic agent, an anti-

rejection agent, a hormone, a therapeutic component, a cellular component, and a combination thereof.

78. (Currently amended) A method of treating a medical condition in a mammalian body [(350)], the method comprising:

forming an alginate bioreactor [(310)] within a portion of the mammalian body, the alginate bioreactor including an alginate matrix [(320)]; and

eluting a therapeutic agent [(340)] from one of a therapeutic component [(330)] or a cellular component [(332)] dispersed within the alginate bioreactor.

79-97. (Canceled)